Application No.: 10/674,022
Amendment dated: 12/21/05
Reply to Office Action mailed: 09/30/05

Remarks/Arguments

Applicants' consider the rejection of claims 3-5 and 7 under 35 U.S.C. 112 to have been obviated by the current amendments to Applicants' claims 3-5 and 7.

The rejection of Applicants' claims 1, 6, 8-10, 12, 13 and 19 under 35 U.S.C. 102(b) as anticipated by U.S. Patent 5,025,631 issued June 25, 1991 to Paul W. Garbo (Garbo) is respectfully traversed and reconsideration is respectfully requested.

Garbo does not show a process for liquefying a light hydrocarbon gas. Garbo also does not show the use of a fossil fueled turbine to produce an exhaust gas stream at elevated temperature. Garbo also does not show any type of compression of a refrigerant stream and there is no turbine exhaust stream at an elevated temperature in Garbo. There is no showing in Garbo of any of Applicants' claims under 35 U.S.C. 102.

Accordingly it is respectfully requested that all rejections of Applicants' claims 1, 6, 8-10, 12, 13 and 19, as anticipated under 35 U.S.C. 102(b) by Garbo, be withdrawn.

The rejection of Applicants' claims 2, 7, 11, 14, 18 and 20 under 35 U.S.C. 103(a) as unpatentable over Garbo, in view of U.S. Patent 4,566,885 issued January 28, 1986 to Frederick W. Haak (Haak) is respectfully traversed and reconsideration is respectfully requested.

Haak discloses the use of a gas turbine with a compressor to compress two refrigerant streams, which are disclosed to be different streams. These streams are produced by gas fueled turbines which drive compressors to compress the refrigerant to a desired pressure for use in a natural gas liquefaction process. A compressor and an electrical generator are shaft coupled to each turbine to produce electricity in varying amounts when the compression load on the specific turbine is reduced. This permits generation of electricity by the generator on each turbine shaft when the load on the particular compressor permits so that the electricity can be distributed to auxiliary electric motors on each shaft to keep all turbines supplemented by electrical power so that the compressors operate at maximum capacity. There is no suggestion that hot gas from the turbine exhaust is used to drive the generators directly or by any other means.

Accordingly, this reference does nothing to show or suggest the use of a hot exhaust gas from a gas fired turbine to produce steam for use to drive an electric generator. The references cannot be combined to show Applicants' claimed invention.

This reference is not properly combinable with Garbo and even if combined can only be used to substitute inconsistently into Garbo, as Garbo does not use a light hydrocarbon fueled turbine exhaust stream to produce electricity.

Accordingly it is respectfully requested that all rejections of Applicants' claims under Garbo, in view of Haak under 35 U.S.C. 103(a), be withdrawn.

The rejection of Applicants' claims 3-5 and 15-17 under 35 U.S.C. 103(a) as unpatentable under Garbo, in view of any one of U.S. Patent 5,457,951 issued October 17, 1995 to Paul C. Johnson , et al (Johnson, et al); U. S. Patent 5,295,350 issued March 22, 1994 to Edward T. Child, et al (Child, et al); or, U.S. Patent 4,907,405 issued March 13, 1990 to Robert J. Polizzotto (Polizzotto) is respectfully traversed and reconsideration is respectfully requested

Johnson, et al discloses a process wherein liquid natural gas (LNG) is supplied to a storage vessel and thereafter is vaporized by heat exchange with a heated water stream which is then passed to a heat exchanger to produce chilled air for passage to an inlet to a light hydrocarbon gas-fired turbine which drives a turbine and generator. There is no suggestion that the light hydrocarbon fuel-fired turbine is used to compress refrigerant in any way. The hot exhaust gas from a waste heat boiler 36 does appear to be used to produce high pressure steam which is then used to drive a steam turbine which produces electricity with the discharge then being passed to either a cooling water heat exchanger or a warm water heat exchanger which produces a heat exchange fluid for use to vaporize the LNG.

There is no suggestion in this reference that hot exhaust gas from a gas fueled turbine should be used to power an electrical generator to produce electrical power. This reference does not suggest any disposition of the electrical power.

It is also pointed out that this is not a light hydrocarbon gas liquefaction process and is, in fact, the opposite, i.e., an LNG vaporization and use process.

It is respectfully submitted that this reference is not properly combinable with any of the previously cited references and does not show or suggest any of Applicant's claims, taken alone or in combination with any of the other references.

Child, et al discloses a process for producing mechanical and electrical power along with synthesis gas or fuel gas with a partial oxidation processes. The only generators noted were generators 127, 139 and 184. All of these generators appear to be shaft driven by a turbine. Generator 127 is driven by a combustion turbine, generator 184 is driven by a vaporized LNG expander and generator 139 is driven by a steam turbine driven by steam produced at least partially from the hot exhaust gases from a steam turbine 137. No suggestion was noted that any of the turbines are used to drive compressors for refrigeration for an LNG refrigeration process or that any carbon dioxide emission reductions were considered or achieved. This appears to be primarily an LNG vaporization process.

Accordingly, it is respectfully submitted that this reference, taken alone or with Garbo, does nothing to suggest Applicants' claimed invention.

Polizzotto discloses a process which uses steam produced by a cogeneration facility to cool gas when the steam is passed through an absorption chiller to cool water which in turn is used to cool the gas. In this process gas is combusted in a light hydrocarbon fuel fired turbine which drives a generator with the exhaust gas being passed to a steam generation section 12 with the steam from section 12 being passed to a second turbine to drive a generator. There is no suggestion in the process that it is in any way useful for the production of liquefied light hydrocarbon gas.

This reference also appears to be related to a less relevant technology.

None of the references cited, in combination with Garbo, have shown or suggested Applicants' claimed invention as presently claimed in claims 3-5 and 15-17.

While none of these references taken alone or in combination have shown or suggested Applicants' claimed invention, it is respectfully submitted that what these references in combination have shown is that in this area continued improvement is sought and the types of equipment useful are commonly used in a wide range of processes. None of these references

appear to have shown Applicants' claimed invention comprising the claimed elements and steps in combination to achieve the desired results. None of these references appear to show that any reduction in carbon dioxide emissions are achieved by the use of the processes disclosed.

In summary, Applicants' claimed invention relates to a method for producing required refrigerant compression and shared electrical power for a light hydrocarbon gas liquefaction process by a process in which carbon dioxide emissions are reduced by a specifically recited series of steps in combination. New claims 21 and 22 have been added to more succinctly claim the invention.

It is respectfully submitted that none of the Applicants' claims as presently pending have been shown or suggested by the cited references, taken alone or in combination.

No discussion of the remaining references is considered necessary since these references were not applied against Applicants' claims.

In view of the foregoing comments, it is respectfully submitted that none of the references applied have shown or suggested any of Applicants' claims, as presently pending, under 35 U.S.C. 102(b) or 35 U.S.C. 103(a).

It is respectfully submitted that Applicants' claims are now in condition for allowance and such is respectfully solicited.

Respectfully submitted,

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